7.10 GREAT FALLS CARBON MONOXIDE LIMITED MAINTENANCE PLAN

7.10.1 Introduction

As a result of the 1977 amendments to the Clean Air Act (CAA), Great Falls was designated as nonattainment for carbon monoxide (CO) by the U.S. Environmental Protection Agency (EPA) in a Federal Register (FR) notice (45 FR 59315) on September 9, 1980. The National Ambient Air Quality Standard (NAAQS) for CO is 9 parts per million (ppm) for an 8-hour average concentration, not to be exceeded more than once per calendar year.

Following the nonattainment designation, control plans were developed but none were approved by EPA. The Great Falls CO nonattainment issue was reevaluated in September 1990 based on the requirements in the 1990 amendments to the CAA and the lack of exceedances in the 1988 and 1989 CO monitoring data. In the November 6, 1991 FR (56 FR 56799), Great Falls was listed as a "Not Classified" CO nonattainment area (NAA). However, EPA's redesignation process required a new EI (EI) and development of a maintenance plan.

The Montana Department of Environmental Quality (Department) developed a redesignation request with guidance based on the 1990 CAA amendments and a September 4, 1992 EPA memo from John Calcagni to the EPA Regional Air Directors. The Governor of Montana submitted the redesignation request to EPA on February 9, 2001, and EPA approved it in the May 9, 2002 FR (67 FR 31143). Section 107(d)(3)(E) of the CAA defines the five required criteria of a redesignation request. The criteria are as follows:

Criterion 1: *Attainment of the Applicable National Ambient Air Quality Standard*
Criterion 2: *State Implementation Plan Approval*
Criterion 3: *Permanent and Enforceable Improvements in Air Quality*
Criterion 4: *Fulfillment of CAA Section 110 and Part D Requirements*
Criterion 5: *Fully Approved Maintenance Plan under CAA Section 175A*

Criterion 5 is addressed based on fulfillment of criteria addressed in the October 6, 1995 EPA memo from Joseph Paisie, Group Leader for Integrated Policy and Strategies Group. That memo stated nonclassifiable CO nonattainment areas fulfilling specific criterion could choose to seek redesignation under a limited maintenance plan (LMP) rather than the more rigorous full maintenance plan. At the end of 2009, Great Falls still met the LMP criterion as outlined in the Paisie memo by having a CO design value at or below 7.65 ppm (85 percent of the 8-hr NAAQS).

Under the LMP option of CAA Section 175A, after the initial 10-year period, States are required to submit a revision or update to the LMP for another 10-year period. The Department has updated the 2002 Great Falls CO LMP and the revisions are discussed under the following five provisions.

7.10.6.1 Provision 1: Attainment Inventory

On February 1, 2000, the Department submitted an EI for 1996 to EPA as part of the Great Falls CO redesignation request. The CO emissions in the EI were calculated to represent a standard CO season day, a typical 'winter day' in a typical 'CO season' for the base year of 1996 (January 1 to December 31). The CO season covered the months of November, December, and January 1996. A weekday during the CO season was selected since the highest average daily traffic (ADT) generally occurs during the work week (i.e., Monday – Friday). The study area included 150 one-kilometer squared (km^2) grids which included the Great Falls NAA, and the greater Great Falls urban area, including the community of Black Eagle.

The total amount of CO emissions estimated in the 1996 Great Falls CO EI study area on a standard CO season weekday was 53,945.52 kilograms (kg). Twenty-four area and three industrial point sources were identified as significant CO emitters. These sources were assigned to seven broad categories: aviation exhaust (721.21 kg/day), commercial and residential natural gas combustion (312.62 kg/day), industrial point sources (180.46 kg/day), nonroad motor exhaust (4,676.0 kg/day), railroad locomotive exhaust (24.30 kg/day), residential wood burning (5,644.12 kg/day), and roadway motor vehicle exhaust (42,386.81 kg/day).

Motor vehicle exhaust contributed the majority (78.57 percent) of all estimated CO emissions. Minor contributing source categories and their corresponding daily percentage of contribution were residential wood burning devices (10.46 percent), nonroad motor exhaust (8.67 percent), and aviation exhaust (1.34 percent). Commercial and residential natural gas combustion, railroad locomotive exhaust, and three industrial point sources all emitted less than one percent of the estimated daily CO emissions in the 1996 Great Falls CO EI study area.

The 1996 CO EI used estimates of actual emissions and the 2009 CO EI update was developed with surrogates applied to the 1996 EI emissions, except for the industrial point sources where actual emissions were obtained from the Department's permit fees database (CEDARS -Consolidated Environmental Data Acquisition and Retrieval System). The emissions were again divided into seven source categories: aviation

exhaust, commercial and residential natural gas combustion, industrial point processes, nonroad motor vehicle exhaust, railroad locomotive exhaust, residential wood burning, and onroad motor vehicle exhaust. The 1996 EI was updated to 2009 levels using a combination of factors such a population growth, change in traffic volumes, and the results of the most recent EI of industrial point sources, which are discussed below.

Population

The percent change in the population of Cascade County from 1996 to 2009 was selected as a surrogate to estimate the change in emissions for several area source categories. Every year by July 1, the Montana Department of Commerce, Census and Economic Information Center (CEIC) estimates the population of Montana cities and counties using U.S. Census data. As of July 1, 1996, the population of Cascade County was estimated at 82,4291 and on July 1, 2009, the county population was estimated at 82,1782, a decrease of 0.31% (-0.31%) over the 1996 to 2009 time period. Over the same time period, the estimated population of the city of Great Falls increased from 57,881 to 59,3663, resulting in a change of 2.50 percent. Department staff, using professional judgment, elected to use the change in the city population as the more conservative value for estimating increases in certain area source categories.

Industrial Point Sources

Table 7.10.6.1.A presents the estimated actual 1996 and 2009 emissions for a CO season day for the three point sources in the Great Falls CO NAA with their 1996 operating schedules. For consistency and due to lack of additional information, the 1996 operating schedules were applied to the annual 2009 emissions. In addition, a relatively significant point source was added to this table, the City of Great Falls Wastewater Treatment Plant that was not operational in 1996. It should be noted that no industrial point sources exit with the Great Fall CO NAA.

1 http://www.ceic.mt.gov/HistoricalPopData.asp
2 http://www.ceic.mt.gov/index.asp
3 http://ceic.mt.gov/

Table 7.10.6.1.A. Point Source Emissions in the Great Falls CO NAA, 1996 and 2009 CO Season Days.

Source	Hours /Day	Days/ Week	Weeks /Year	Percent of Emissions During CO Season	1996 Actual CO Season (kg CO/CO day)[1]	2009 Actual CO Season (kg CO/CO day)	Percent Change	Permit Number
City of Great Falls Wastewater Treatment Plant	24	7	52	0	0.00	171.85	171.85	4176
Montana Air National Guard Base	24	7	52	25	28.72	16.69	- 41.9	2930
Malmstrom Air Force Base	24	7	31	44	47.62	103.68	117.8	1427
Montana Refining Company	24	7	52	25	104.13	38.43	- 63.09	2161
Totals	--	--	--	--	180.46	329.65	46.17	--

[1.] kg = kilograms.

Any industrial point source emitting less than 1 metric ton during a CO season day in the Great Falls CO NAA was not included in this table for consistency with the approach in the development of the initial 1996 Great Falls CO EI. This method eliminated the six point sources listed in Table 7.10.6.1.B. If these six sources were included in the 2009 EI update, their emissions would only represent approximately 4% of the total CO emissions from the point sources within the Great Falls CO NAA.

Table 7.10.6.1.B. Point Sources & Emissions Omitted from the 1996 to 2009 CO Season Day Update.

Source	2009 Actual CO Season (kg CO/CO day)[1]	Permit Number
Cereal Food Processors, Inc.	1.04	2885
CHS Incorporated	7.87	2842
General Mills Flour Mill	0.41	2849
Great Falls Animal Shelter	0.39	3082
Montana Specialty Mills, LLC	1.04	2968
Westfeeds, Inc.	2.24	3093
Total	12.99	

1. kg = kilograms.

Annual Average Daily Traffic

The mobile source EI surrogate chosen was annual average daily traffic (AADT) increases based on data collected over the 1996 to 2009 time period by Montana Department of Transportation automatic traffic recorders (ATR) on the roadways in the Great Falls CO EI study area4. The three, representative data sets chosen were:

- 10th Avenue South (U.S. 89) between 9th and 10th Streets,
- 25th Street North between 4th and 5th Avenues, and
- 26th Street North between 4th and 5th Avenues.

These roads are classified as principal arterial and minor arterials (2), respectively. Note: the 10th Avenue South arterial is within the Great Falls CO NAA. Table 7.10.6.1.C lists the AADT data collected during the 1999 through 2009 period for these three roads.

4 http://www.mdt.mt.gov/publications/docs/datastats/atr/atrbook09.pdf

Table 7.10.6.1.C. AADT Data for Selected Roads in the Great Falls CO NAA, 1996 - 2009.

Year	Annual Average Daily Traffic		
	10th Avenue South	25th Street North	26th Street North
1996	35,153	4,107	3,530
1997	35,884	4,141	3,511
1998	35,457	4,183	3,686
1999		4,520	3,833
2000		4,218	3,572
2001	36,354	4,243	3,535
2002	37,612	4,205	3,457
2003	39,071	4,351	3,756
2004	40,280	4,580	3,730
2005	38,770	4,060	3,370
2006	38,330	3,930	3,390
2007	38,161	3,876	3,229
2008	37,283	3,741	3,130
2009	37,378	3,825	3,052
1996 to 2009 Δ%	**6.33**	-6.87	-13.54

The average of all percent changes in AADT for the three roadways over 1996 to 2009 was - 4.69%. The percent change value of 6.33% from the 10th Avenue South data was selected as a representative value for this demonstration since it was derived from an ATR within the Great Falls CO NAA.

The designated Great Falls CO NAA is two (2) blocks wide by about four miles long or about 1.5 km^2 within the city of Great Falls. The 1996 Great Falls CO EI encompassed 150 one km^2 grids that included the NAA, which was about 1% of the inventoried study area. The 1996 EI did not estimate the CO emissions within the NAA, therefore, the 2009 emissions address the entire Great Falls EI study area. The overall result of the Great Falls CO NAA EI update from 1996 to 2009 for a CO season day in kg is listed in Table 7.10.6.1.D.

Table 7.10.6.1.D. Great Falls CO NAA Emissions Comparison between 1996 & 2009 CO Season Days.

Source Category	**1996 Total Emissions** (kg CO/CO day)[1]	**1996 Percent of Total**	**2009 Total Emissions** (kg CO/CO day)	**2009 Percent of Total**	**Percent Change 1996 to 2009**	**Surrogate**
Aviation	721.21	1.34	739.24	1.30	2.50	Population
Commercial & Residential Natural Gas	312.62	0.58	320.44	0.56	2.50	Population
Industrial Point Sources	180.46	0.33	263.78	0.46	46.17	Permit Fee EI
Nonroad Motors	4,676.00	8.67	4,792.90	8.41	2.50	Population
Railroad Locomotives	24.30	0.05	24.91	0.04	2.50	Population
Residential Wood Burning	5,644.12	10.46	5,785.22	10.15	2.50	Population
Roadway Motor Vehicle	42,386.81	78.57	45,069.90	79.08	6.33	AADT[2]
TOTAL	53,945.52	100.00	56,996.38	100.00	9.29 (Average)	--

1. kg = kilograms.
2. AADT = Annual average daily traffic.

7.10.6.2 Provision 2: Maintenance Demonstration

An October 6, 1995 EPA memo from Joseph Paisie, Group Leader for Integrated Policy and Strategies Group stated nonclassifiable CO nonattainment areas fulfilling specific criteria could choose to seek redesignation under a less rigorous plan than the full maintenance plan. To qualify for the LMP option, the CO design value for the area, based upon the eight quarters (two years of data) used to demonstrate attainment must be at or below 7.65 ppm (85 percent of the 8-hr NAAQS). Additionally, the design value for the area must continue to be at or below 7.65 ppm until the time of final EPA action on the redesignation request.

Design values are determined based on the procedure outline in a June 18, 1990 EPA memo from William Laxton, Director of the Technical Support Division. For the 8-hour NAAQS, the design value is determined by the second maximum 8-hour concentration value for the most recent two years or eight quarters of data. The larger of the second maximum values (or the "highest of the second highs") is used as the design value for each CO monitoring site. If more than one monitoring site exists in the area, the highest site design value is used as the design value for the entire NAA.

For the development of the initial Great Falls CO LMP, there was only one monitoring site, Skyway Conoco at 700 10th Avenue South, operating in the Great Falls CO nonattainment area during 1998 and 1999. For the initial LMP, the "highest of the second highs" was monitored in 1998 with a design value of 4.5 ppm. Since that design value was below the 7.65 ppm limit, the Great Falls CO NAA met the eligibility criterion for a LMP.

Over approximately the next decade, another CO monitoring site, Overlook Park, operated in the Great Falls area. The Department documented the installation and removal of the Overlook Park and Skyway Conoco sites, respectively, through the annual network review process and via the submittal of network modification request forms to the EPA Region 8 office. All monitoring site actions were approved by EPA Region 8. The current CO monitoring site in Great Falls, Overlook Park (#30-013-0001), has operated in the city park at the corner of 10th Avenue South and 2nd Street since mid-2001. Based on the data from 2008 and 2009, the latest design value is 1.6

ppm, which is well below the 8-hr NAAQS of 9 ppm and the CO LMP eligibility threshold of 7.65 ppm. Figure 7.10.6.2.A represents the second highest 8-hr CO concentrations from all three of Montana's CO NAAs from 1998 through 2009.

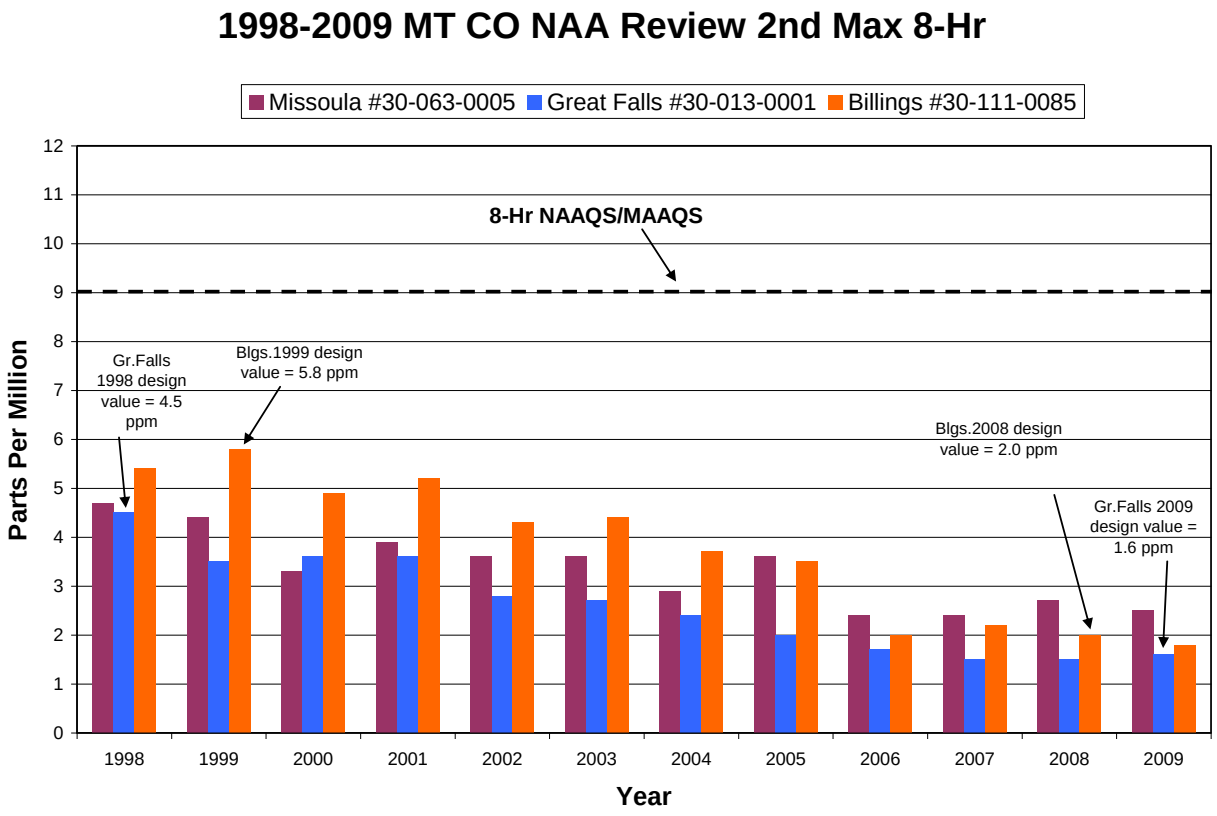

Figure 7.10.6.2.A. Second highest 8-hr CO concentrations in Montana CO NAAs from 1998 through 2009.

7.10.6.3 Provision 3: Monitoring Network/Verification of Continued Attainment

CO compliance monitoring in the Great Falls area will continue. In the previous LMP this consisted of the Department and the Cascade City/County Health Department (CCCHD) operating a gaseous CO monitoring instrument in an ambient air monitoring shelter in accordance with the Montana Quality Assurance Project Plan (QAPP), the EPA Quality Assurance Manual (EPA-600/9-76-005, revised December 1984), 40 CFR Part 50 including Appendix C, and 40 CFR Part 58 including Appendices A through G. Precision and accuracy data from the CO monitoring site(s) was submitted to EPA on a regular basis through the federal air quality database.

The Department will continue to monitor CO using an instrumental method or a functionally equivalent monitoring methodology as approved by EPA. Emergency episode CO monitoring in Great Falls shall be conducted, if necessary, in accordance with Montana's Emergency Episode Avoidance Plan.

7.10.6.4 Provision 4: Contingency Plan

Section 175(A)(d) of the CAA requires that the maintenance plan contain contingency provisions to assure that Montana will promptly correct any violation of the CO NAAQS that might occur after the Great Falls CO NAA was designation back to attainment. EPA's redesignation guidance notes that Montana is not required to have fully adopted contingency measures that would take effect without further action by Montana. However, the contingency plan should ensure that contingency measures are adopted expeditiously once the need is triggered. The primary elements of the maintenance plan involve the tracking and triggering measures to determine when contingency measures are needed and a process for implementing appropriate control measures.

A. CO Concentration Tracking

As mentioned above in Provision 3, the Department and CCCHD will conduct traditional gaseous CO monitoring or surrogate compliance monitoring in the Great Falls area.

B. SIP-Mandated Trigger and Response

i. Trigger

The LMP will use one exceedance of the CO NAAQS as the trigger for adopting specific contingency measures. The adopted contingency measure(s) will be implemented only if a violation of the CO NAAQS occurs. Notification to EPA and to the local governments in the Great Falls area of any exceedance will occur within 60 days as part of the Quality Assurance/Quality Control (QA/QC) monitoring procedure.

ii. Response

Upon notification of a CO NAAQS exceedance, the Department and CCCHD will recommend appropriate contingency measure(s) intended to avoid a violation of the CO NAAQS. Information on the historical exceedances of the standard, the

meteorological conditions related to the recent exceedance(s), and the most recent estimates of population and traffic growth and emissions will be reviewed. The possibility that an exceptional or natural event occurred will also be evaluated. Following the review of this information, the necessary contingency measure(s) will be proposed for local adoption. The local adoption process will be completed within three months of the exceedance notification. The contingency measures provide a maintenance area with the opportunity to maintain its status as an attainment area.

If and when a violation of the NAAQS occurs, the locally adopted contingency measure(s) will be fully implemented within one year. Section 175(A)(d) of the CAA states:

The failure of any area redesignated as an attainment area to maintain the national air quality standard concerned shall not result in a requirement that the State revise its State implementation plan unless the Administrator, in the Administrator's discretion, requires the State to submit a revised State implementation plan.

C. Possible Contingency Measures

The CCCHD may choose one or more contingency measures to recommend to local officials and the Department for consideration. The CCCHD will select contingency measures designed to bring the area back into compliance with the CO NAAQS quickly and to specifically meet the needs of the Great Falls area. Some potential contingency measures include:

- Implementation a local oxygenated fuel program in the Great Falls or Cascade County area for the winter months of November, December, and January (typically the months with the highest ambient CO levels);
- Implementation of an episodic woodburning curtailment program; and/or
- Other emission control measures appropriate for the area that are yet to be defined.

D. Maintenance Plan Requirements

After submittal and approval of this second 10-yr LMP, there are no further requirements for any additional revisions or modifications to the LMP.

7.10.6.5 Provision 5: Conformity Determinations Under Limited Maintenance Plans

The conformity provisions of the second 10-year plan will continue from the initial plan. Since the Great Falls area was a 'Not Classified' nonattainment CO area, only some of the general provisions of the CAA Part D apply. These include the "General" and "Transportation" conformity provisions of CAA Section 176(c). The conformity provisions ensure that federally funded or approved projects and actions conform to the air quality planning goals of the Great Falls CO control plan before they are constructed. For the purpose of the LMP for Great Falls, the conformity issues are slightly different than in a full maintenance plan and are explained below.

The transportation conformity rule of November 24, 1993 (58 FR 62188) and the general conformity rule of November 30, 1993 (58 FR 63214) apply to nonattainment areas and maintenance areas operating under maintenance plans. Under either rule, conformity can be demonstrated by indicating that the expected emissions from planned actions are consistent with the emissions budget for the area. In areas with LMPs, conformity determinations are still required, but a LMP has no emission budget because "emissions budgets in limited maintenance plan areas may be treated as essentially not constraining for the length of the initial maintenance period" ("Limited Maintenance Plan Option for Nonclassifiable CO Nonattainment Areas," memorandum from Joseph Paisie to the EPA Regional Air Branch Chiefs, October 6, 1995).

For general conformity, all projects are considered to satisfy the "budget test" specified in 40 CFR 93.158(a)(5)(i)(A) once EPA has approved this redesignation request. For transportation conformity, federal actions requiring conformity determinations are considered to satisfy the budget test specified in sections 93.118, 93.119 and 93.120 of the conformity rule once this LMP is found adequate by EPA. In Great Falls, federal actions are also considered to satisfy the transportation conformity rule's requirements for expeditious implementation of transportation control measures (TCMs), because there are no TCMs in the Great Falls SIP. Transportation plans, transportation improvement programs and Federal projects still require conformity determinations in order to proceed, and Federal projects are still subject to the hotspot modeling requirements of the transportation conformity rule.

STATE OF MONTANA AIR QUALITY CONTROL IMPLEMENTATION PLAN	Subject: Cascade County Carbon Monoxide Limited Maintenance Plan

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